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Air Operating Permit Excess Emissions Report Form Part II

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|---------------------------------|-----------------------------|---|-------------|
| Name of Facility | Shell, Puget Sound Refinery | Reported by | Tim Figgie |
| Date of notification | April 29, 2010 | Incident type: breakdown/ upset/startup or shutdown | Malfunction |
| Start Date | April 29, 2010 | Start Time: | 9:00 PM |
| End Date | April 29, 2010 | End Time: | 11:00 PM |
| Process unit or system(s): SRU4 | | | |

Incident Description

On April 29, 2010 at 9:00 PM SRU 4 exceeded its 1000 ppm SO₂ 1 hour average limit on the incinerator. The high SO₂ was a result of having to move the full refinery AAG and SWG make into the unit (which had been running in hot standby) immediately after a global trip on SRU 3. Two, 1-hour average periods were exceeded.

SRU 3 globally tripped on low air pressure in the incinerator. After an investigation it was determined that the cause of the global trip was the introduction of hydrocarbons into SRU 3 that had come in with the amine acid gas from the Amine Recovery Unit's (all 3 of which were affected). It was determined that the hydrocarbon was fed into the ARUs with the rich amine from tank 104. After much investigation, it is still unclear how the hydrocarbon got through tank 104 whose level remained ~ 50 pct and consistent the whole time. Additionally, the tank pressure remained consistent and did not vent to the flare at all.

In examining all of the potential hydrocarbon sources, there is only one that appears suspicious, having unstable operations shortly before the incident. The HTU1/CRU1 absorber column (7CC25) underwent level and pressure fluctuations that could potentially have allowed hydrocarbon to be carried through the bottoms with the amine, though this is not definitive. Based on the composition in the column at the time and the lack of activity on tank 104, this even seems improbable.

It is known with almost complete certainty that hydrocarbon from the ARUs caused the global trip on SRU 3; however, the source of the hydrocarbon remains uncertain. Because the 7CC25 column level appears to be a potential contributor to the incident, process engineering will reevaluate the level alarm system as a preventative measure for the future.

Immediate steps taken to limit the duration and/or quantity of excess emissions:

SRU4 operations was stabilized as soon as possible.

Applicable air operating permit
term(s): 4.10 & 4.11

| | | |
|---|----------------------------------|---------------------------|
| Estimated Excess Emissions: Based on SO ₂ CEMS and calculated stack flow | Pollutant(s): SO ₂ | Pounds (Estimate): 240 |
|---|----------------------------------|---------------------------|

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The incident was the result of the following (check all that apply):

- ☐ Scheduled equipment startup
- ☐ Scheduled equipment shutdown
- ☐ Poor or inadequate design
- ☐ Careless, poor, or inadequate operation
- ☐ Poor or inadequate maintenance
- ☐ A reasonably preventable condition

Did the facility receive any complaints from the public?

- ☒ No
- ☐ Yes (provide details below)

Did the incident result in the violation of an ambient air quality standard

- ☒ No
- ☐ Yes (provide details below)

Root and other contributing causes of incident:

The root cause of this incident could not be identified. However, because the 7CC25 column level appears to be a potential contributor to the incident, process engineering will reevaluate the level alarm system as a preventative measure for the future.

The root cause of the incident was:

(The retention of records of all required monitoring data and support information shall be kept for a period of five years from the date of the report as per the WAC regulation (173-401-615))

- ☒ Identified for the first time
- ☐ Identified as a recurrence (explain previous incident(s) below – provide dates)

The root cause of this incident could not be identified although on 2/26/09 an incident occurred that was the result of hydrocarbon in the amine.

Are the emissions from the incident exempted by the NSPS or NESHAP "malfunction" definitions below?

- ☐ No
- ☒ Yes (describe below)

The root cause could not be identified.

Definition of NSPS "Malfunction": Any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or failure of a process to operate in a normal or usual manner. Failures that are caused in part by poor maintenance or careless operation are not malfunctions. 40 CFR 60.2

Definition of NESHAP "Malfunction": Any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions. 40 CFR 63.2

Analyses of measures available to reduce likelihood of recurrence (evaluate possible design, operational, and maintenance changes; discuss alternatives, probable effectiveness, and cost; determine if an outside consultant should be retained to assist with analyses):

The root cause of this incident could not be identified. However, because the 7CC25 column level appears to be a potential contributor to the incident, process engineering will reevaluate the level alarm system as a preventative measure for the future.

Description of corrective action to be taken (include commencement and completion dates):

See above

If correction not required, explain basis for conclusion:

See above

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Attach Reports, Reference Documents, and Other Backup Material as Necessary. This report satisfies the requirements of both NWCAA regulation 340, 341, 342 and the WAC regulation (173-400-107).

Is the investigation continuing? ☒ No ☐ Yes

Is the source requesting additional time for completion of the report? ☒ No ☐ Yes

Based upon information and belief formed after reasonable inquiry, I certify that the statements and information in this document and all referenced documents and attachments are true, accurate and complete.

Prepared By: _ Jaime Ambrosio _ Date: _ May 5, 2010 _

Responsible Official or Designee: Jim G. Krueger Date: 5/28/10